

Amendment and Response

Applicant: Eugene M. Levin et al.

Serial No.: 10/092,214

Filed: March 5, 2002

Docket No.: S265.101.101 (31257-UT)

Title: METHOD AND APPARATUS FOR PROPULSION AND POWER GENERATION USING SPINNING
ELECTRODYNAMIC TETHERS

REMARKS

The following remarks are made in response to the Office Action mailed September 3, 2002. Claims 1-44 remain pending in the application and are presented for reconsideration and allowance. Claims 1 and 20 have been amended to improve their clarity.

Claim Rejections under 35 U.S.C. § 112

The Examiner rejected claims 1 and 20 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as their invention. In particular, the Examiner has indicated that the term “below approximately 2,000 km” in original claims 1 and 20 is a relative term, which renders the claims indefinite. In the above Amendment, the phrase “below approximately 2,000 km” has been removed from amended claims 1 and 20. Amended claims 1 and 20 now simply refer to “low earth orbit,” which is clearly defined in the specification at page 25, lines 17-19, as “below approximately 2,000 km, where the magnetic field is strong enough and plasma density is not very low to support reasonably effective electrodynamic tether operation along the orbit.”

In view of the above, Applicants respectfully submit that the amended independent claims 1 and 20 are now sufficiently definite to meet the requirements of 35 U.S.C. § 112. Therefore, withdrawal of the section 112 rejection with respect to independent claims 1 and 20 and allowance of these claims is requested.

Claim Rejections under 35 U.S.C. § 102

The Examiner rejected claims 1-3, 5-7, 10-14, 17-18, and 20-44 for being anticipated by Forward et al. (U.S. Patent No. 6,116,544). The Forward et al. patent is directed to electrodynamic tethers, and discusses several embodiments and uses thereof including a rotating tether system. Applicants respectfully point out that rotating tether systems as disclosed in the Forward et al. patent do not teach or suggest the tether system and method for operating a tether system of independent claims 1 and 20, respectively.

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Independent claim 1 includes at least one spinning electrodynamic tether that is adapted to spin at an average rate exceeding approximately two times an orbital revolution with respect to inertial space. Independent claim 20 includes providing a spinning electrodynamic tether and spinning the electrodynamic tether at an average rate exceeding approximately two times an orbital angular rate of the low earth orbit. The Forward et al. patent does not teach or suggest an electrodynamic tether adapted to spin at a rate of at least twice that of the orbital rate, as claimed in independent claim 1. Also, the Forward et al. patent does not teach or suggest a method of operating a spinning electrodynamic tether including spinning the tether at an average rate exceeding approximately two times an orbital angular rate of the low Earth orbit, as claimed in independent claim 20.

The Forward et al. patent also does not teach or suggest an electric control system adapted to control the electric current in the tether to thereby control the spinning and increase average long term orbit transfer or power generation rates taking advantage of spinning, as claimed in independent claim 1. Likewise, the Forward et al. patent does not teach or suggest controlling the electric current in the tether to thereby control the spinning and increase average long term orbit transfer or power generation rates, taking advantage of spinning, as claimed in independent claim 20.

Although the Forward et al. patent discloses a control system for stabilizing the tether, embodiments of tether systems taught by the Forward et al. patent contemplate maintaining a particular angle of the tether relative to the Earth's magnetic field. Although the maintaining of such an angle involves rotating the tether as the entire tether system orbits around the Earth, this type of rotation is not at a rate approximately two or more times the orbital rotation rate, as claimed in independent claims 1 and 20.

In view of the above, not every limitation of independent claims 1 and 20 is taught or suggested by the Forward et al. patent, which is relied upon for the 35 U.S.C. § 102(e) rejection. Furthermore, as dependent claims 2-19 and 21-44 further define patentably distinct independent claims 1 and 20, respectively, these dependent claims are also believed to be allowable. In view

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of the above, Applicants request withdrawal of the § 102(e) rejections and allowance of claims 1-3, 5-7, 10-14, 17-18, and 20-44.

Claim Rejections under 35 U.S.C. § 103

The Examiner rejected claims 4, 8-9, 15-16, and 19 for being unpatentable over Forward et al. (U.S. Patent No. 6,116,544).

In view of the above argument with respect to the 35 U.S.C. § 102(e) rejection of independent claims 1 and 20, independent claims 1 and 20 are believed to be patentably distinct over the Forward et al. patent. Since dependent claims 4, 8-9, 15-16 and 19 further define patentably distinct independent claim 1, these dependent claims are also believed to be allowable. Therefore, Applicants respectfully request withdrawal of the § 103 rejections and allowance of claims 4, 8-9, 15-16, and 19.

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CONCLUSION

In view of the above, Applicants respectfully submit that pending claims 1-44 are in form for allowance and are not taught or suggested by the cited references. Therefore, reconsideration and withdrawal of the rejections and allowance of claims 1-44 is respectfully requested.

No fees are required under 37 C.F.R. 1.16(b)(c). However, if such fees are required, the Patent Office is hereby authorized to charge Deposit Account No. 500471.

The Examiner is invited to contact the Applicants' Representative at the below-listed telephone number to facilitate prosecution of this application.

Respectfully submitted,

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CERTIFICATE UNDER 37 C.F.R. 1.8: The undersigned hereby certifies that this paper or papers, as described herein, are being deposited in the United States Postal Service, as first class mail, in an envelope address to: Mail Stop Non-Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 3rd day of December, 2003.

By 

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